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MANUAL REVISION HISTORY

Revision 2014.07.03: Initial Manual Release
Revision 2014.12.17:

- Updated Hardware – Handle

IMPORTANT SAFETY NOTICE

RAD TOOLS ARE SAFE AND RELIABLE. NOT FOLLOWING PRECAUTIONS AND INSTRUCTIONS OUTLINED HERE CAN RESULT IN INJURY TO THE TOOL, OPERATOR AND FELLOW WORKERS.

NEW WORLD TECHNOLOGIES INCORPRATED IS NOT RESPONSIBLE FOR ANY SUCH INJURY.

B-RAD Tool System Safety

The intended use of the B-RAD Tool System is for commercial and industrial bolting applications.

Do not operate the B-RAD Tool System before reading and understanding this user manual and noting the Safety Notices displayed on the B-RAD Tool System and throughout this manual.

Only qualified personnel with training in the safe operation of torque tooling and the B-RAD Tool System should attempt the installation, operation and diagnosis of the B-RAD Tool System.

The B-RAD Tool System is connected to high voltage power and consists of external rotating parts. Improper training and use can cause serious or fatal injury.

Do not disassemble or attempt to repair the B-RAD Tool System; doing so will void warranty. If breakdown, malfunction or damage occurs and the B-RAD Tool System fails to operate correctly, contact New World Technologies Inc. Technical Support (refer to Section 5.0 – Contact Us).

The B-RAD Tool System should only be used if environmental storage and operation specifications have been met. Refer to Section 1.2.3 – Environmental Specifications.

Do not operate the B-RAD Tool System in explosive atmospheres, including, but not limited to, the presence of flammable liquids, gases or dust. The B-RAD Tool System creates sparks which could ignite these substances.

Do not expose the B-RAD Tool System to wet conditions. Water in the B-RAD Tool System will cause damage to the tool and increase the risk of electric shock.

After long durations of use, the B-RAD Tool System will become hot. It is recommended to use the tool in short intervals and allow for cooling between uses to prevent injury to the operator or damage to the B-RAD Tool System.

While operating the B-RAD Tool System, always wear safety goggles and keep all body parts clear of moving parts and the reaction arm contact point.

Never exceed the Maximum Torque of the B-RAD Tool System. Failure to comply will result in void warranty.

The B-RAD Tool System has been calibrated by a qualified Calibration Technician; calibration must be done by a qualified Calibration Technician. Improper calibration can cause damage to the tool and joint.

RAD Li-Ion Battery Pack Safety

Only use the RAD Li-Ion Battery Pack with the B-RAD Tool System. The use of other batteries with the B-RAD Tool System will cause damage to the tool.

The RAD Li-Ion Battery Pack should only be charged on the RAD Battery Charger. If an incompatible charger is used, damage to the RAD Battery will occur.

Keep the RAD Li-Ion Battery Pack away from any metal objects. If the battery terminals are connected by a metal object, the battery will short and will cause damage to the battery and injury to the operator.

Do not expose the RAD Li-Ion Battery Pack to wet conditions. This will cause damage to the RAD Battery and increase the risk of electric shock.

Do not use faulty or deformed RAD Batteries. Do not attempt to open the RAD Battery. Do not short circuit the RAD Battery. Failure to comply will cause damage to the RAD Battery and injury to the operator.

If liquid is ejected from the RAD Battery, avoid contact. If contact occurs, immediately flush with water. If contact with eyes occurs, immediately flush with water and seek medical aid. Liquid from the RAD Battery may cause irritation and/or burns.

RAD Li-Ion Battery Packs cannot be disposed of with regular waste. Return RAD Batteries to your RAD Distributor.

1.0 General Information

1.1 System Components

The B-RAD Tool System is shipped from New World Technologies Inc. in a case with the following parts:

- B-RAD Tool (Figure 1.1-1)
- Two RAD Li-Ion Battery Packs (Figure 1.1-2)
- RAD Battery Charger (Figure 1.1-3)
- Standard Reaction Arm and Snap Ring (Figure 1.1-4)
- Calibration Certificate
- User Manual

Figure 1.1-1: B-RAD Tool

Figure 1.1-2: RAD Li-Ion Battery Pack

Figure 1.1-3: RAD Battery Charger

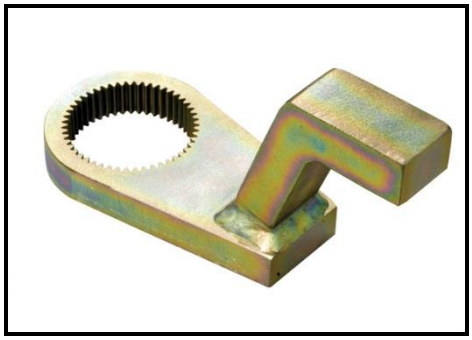

Figure 1.1-4: Standard Reaction Arm

Note: Some distributors may ship additional parts along with the B-RAD Tool System.

1.2 Specifications

1.2.1 Torque Ranges

The following table outlines the torque ranges, in Foot-Pounds and Newton-Meters, of each B-RAD Tool System:

Imperial			Metric	
B-RAD 500	200-500 FtLb	or	B-RAD 675	275-675 Nm
B-RAD 500-2		or	B-RAD 675-2	
B-RAD 1000	400-1000 FtLb	or	B-RAD 1350	545-1350 Nm
B-RAD 1000-2		or	B-RAD 1350-2	
B-RAD 1500	600-1500 FtLb	or	B-RAD 2000	815-2000 Nm
B-RAD 1500-2		or	B-RAD 2000-2	

Table 1.2.1: Torque Ranges

1.2.2 Battery Specifications

Ensure that all Battery Specifications are followed when utilizing the B-RAD Tool System.

Battery Output	
Voltage	18 VDC
Current	30 A
Charge Time	60 minutes
Charger Voltage	
Input	115 VAC
Output	12 – 18 VDC
Charger Output Current	2.5 A

Table 1.2.2: Battery Specifications

1.2.3 Environmental Specifications

CAUTION! Only operate the B-RAD Tool System if the following environmental storage and operation specifications have been met.

Temperature Ranges	°C	°F
Operating Temperature	0 – 35	32 – 95
Charging Temperature	0 – 50	32 – 122
Storage Temperature	-25 – 70	-13 – 158
Humidity	10% to 90% non-condensing	
Shock	10G according to DIN IEC 68-2-6/29	
Vibration	1G, 10-150Hz according to DIN IEC 68-2-6/29	
Required Operating Conditions	- Non explosive atmosphere - Dry location	

Table 1.2.3: Environmental Specifications

1.2.4 Cycle of Operation

- 5 second forward
- 10 second rest and switch to reverse mode
- 5 second reverse mode
- 20 second rest and switch to forward mode

2.0 Tool System

The following sections give a visual and functional description of the Tool Handle, RAD Li-Ion Battery Pack and RAD Battery Charger.

2.1 Tool Handle

The B-RAD (Figure 2.1-1) is trigger activated with a Forward/Reverse Switch. The RAD Li-Ion Battery Pack is attached to the bottom of the Tool Handle.

1. On/Off Trigger – tool activation
2. Forward/Reverse Switch – controls direction of rotation
3. Torque Chart – Settings and corresponding Torque reference
4. Setting Dial – controls Output Torque
5. RAD Li-Ion Battery Pack – refer to Section 2.2 – RAD Li-Ion Battery Pack
6. Battery Release Button – refer to Section 2.2.1 – Insert/Remove the RAD Li-Ion Battery Pack

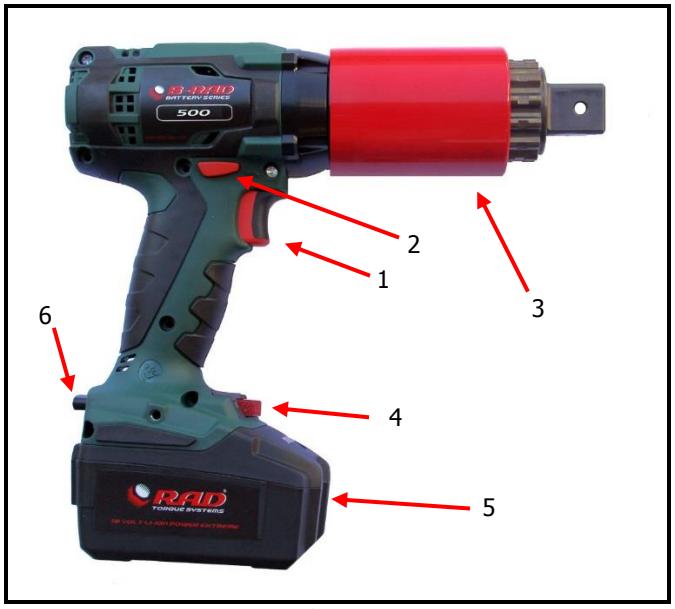

Figure 2.1-1: B-RAD

2.1.1 Trigger Lock

The Trigger Lock is useful while transporting or storing the B-RAD. The Trigger Lock disables the use of the On/Off Trigger, therefore disabling the tool. It is suggested that while the B-RAD is not in use, the Trigger Lock should be enabled.

To enable the Trigger Lock:

1. Slide the Forward/Reverse Switch to the Centre Position (neither fully to the right nor fully to the left).
   Note: The On/Off Trigger cannot be depressed.

To disable the Trigger Lock:

1. Slide the Forward/Reverse Switch to the Forward Position or the Reverse Position.
   Note: The On/Off Trigger can be depressed.

2.2 Torque Chart

The Torque Chart displays the Settings and the corresponding Torque. An example of a Torque Chart is shown in Table 2.2-1.

B-RAD 700-2 Torque Chart FtLbs	
Setting	Torque
1	0
2	234
3	319
4	401
5	503
6	596
7	681
8	818
Cal. Date: 01/01/2010	Serial # B0000

Table 2.2-1: Torque Chart

Note: Do not refer to Table 2.2-1 to determine the Setting for the B-RAD. Each B-RAD is different and has a different Torque Chart. Only use the Torque Chart attached to the B-RAD.

2.3 RAD Li-Ion Battery Pack

CAUTION! Only use the RAD Li-Ion Battery Pack with the B-RAD Tool System. Using other batteries may damage the B-RAD Tool System.

CAUTION! Keep the RAD Li-Ion Battery Pack away from any metal objects. If the battery terminals are connected by a metal object, the battery will short and cause damage to the battery and injury to the operator.

The RAD Li-Ion Battery Pack supplies power to the tool; for the B-RAD to preform best, ensure the RAD Battery is fully charged and in good condition before use. In optimal conditions, the RAD Battery should be capable of approximately 100 Torque Cycles at 50% of the Maximum Torque on a joint with a hardness of approximately 10 degrees.

Note: The application torque, joint hardness, battery condition, age and operating temperature will affect the actual number of Torque Cycles per charge.

2.3.1 Insert/Remove the RAD Li-Ion Battery Pack

To insert the RAD Battery:

1. Ensure the On/Off Trigger is in the Off Position (not depressed).
2. Align the RAD Battery with the bottom of the Tool Handle.
3. Slide the RAD Battery into place until it is fully seated.
   Note: A click will confirm that the RAD Battery is locked in place.
4. Test that the RAD Battery is locked in place by trying to slide it out of place.

To remove the RAD Battery:

1. Press and hold the Battery Release Button.
2. Slide the RAD Battery away from the Tool Handle.

2.3.2 Check RAD Battery Charge

To check the RAD Battery Charge:

1. Press the "Charge" button on the RAD Battery (Figure 2.3.2-1).
   Result: The Red or Green Bars will light up. If all the Bars are illuminated, the Battery is fully charged. If none of the Bars are illuminated, the RAD Battery is completely discharged and needs charging (refer to Section 2.4.1 – Charging the RAD Li-Ion Battery Pack).

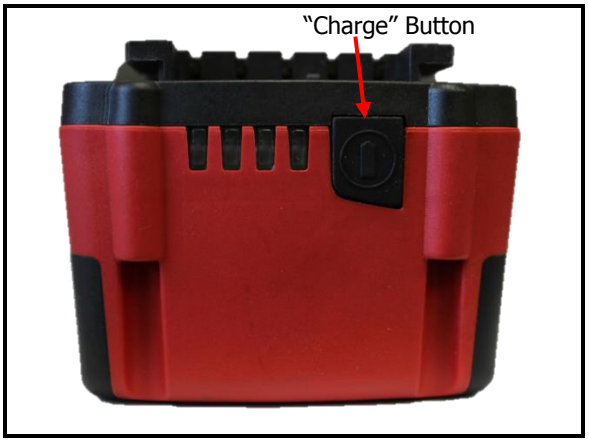

Figure 2.3.2-1: RAD Li-Ion Battery Pack

2.4 RAD Battery Charger

CAUTION! The RAD Li-Ion Battery Pack should only be charged on the RAD Battery Charger. If an incompatible charger is used, damage to the RAD Battery will occur.

The Charging Status Display (Figure 2.4-1) on the RAD Battery Charger is used to notify the operator when the RAD Battery is charging, when the charge is complete and if there is an error.

Figure 2.4-1: Charging Status Display

2.4.1 Charging the RAD Li-Ion Battery Pack

Note: The temperature range for charging is 0˚C to 50˚C (32˚F to 122˚F).

To charge the RAD Battery:

1. Plug the RAD Battery Charger into the wall outlet.
   Result: The Red Warning Light will turn on for one second and then the Green Status Light will turn on for one second.
2. Align the RAD Battery with the RAD Battery Charger.
3. Slide the RAD Battery into place.
   Result: The Green Status Light will flash while the RAD Battery is charging.

When the RAD Battery has been fully charged, the Green Status Light will stop flashing and stay illuminated. Until the RAD Battery is removed from the RAD Charger, it will convert to conservation mode which will maintain the battery charge at maximum capacity.

To remove the RAD Battery:

1. Slide the RAD Battery away from the RAD Charger.
2. Check that the RAD Battery is fully charged (refer to Section 2.3.2 – Checking RAD Battery Charge).

2.4.2 Charging Errors

The Red Warning Light is on:

The RAD Battery is not charging because its temperature is not within the required temperature range for charging. When the RAD Battery's temperature moves within the required range for charging, the Red Warning Light will turn off and charging will commence.

The Red Warning Light is flashing:

The RAD Battery may be placed incorrectly on the RAD Battery Charger. Remove the RAD Battery and replace it correctly on the RAD Battery Charger. If the Red Warning Light continues to flash, the RAD Battery is defective; remove the RAD Battery immediately.

If these problems continue, contact New World Technologies Inc. Technical Support (refer to Section 5.0 – Contact Us) or your RAD Distributor.

3.0 General Operating Instructions

WARNING!

Only qualified personnel with training in the safe operation of torque tooling and the B-RAD Tool System should operate this tool. Refer to the Important Safety Notice for more information.

The B-RAD operates in Torque Cycles. The Torque Cycle passes when the Actual Torque reaches the Target Torque and the Cycle fails if it is interrupted before the Actual Torque reaches the Target Torque.

This section instructs the operator in the use of the Reaction Arm needed for B-RAD operation and how to conduct a Torque Cycle.

3.1 Reaction Arm

WARNING!

Always keep body parts clear of the Reaction Arm when the B-RAD Tool System is in use. Serious injury could occur.

CAUTION!

Ensure the Reaction Arm has a solid contact point before operating the B-RAD Tool System.

3.1.1 Installing the Reaction Arm

Ensure the Reaction Arm and Snap Ring are installed securely to hold the Reaction Arm in place. Make sure the Reaction Arm is in contact with a solid Reaction Point before you operate the tool. Keep your body parts clear of the Reaction Arm when the tool is in operation.

When the tool is in operation the Reaction Arm rotates in the opposite direction to the Output Square Drive and must be allowed to rest squarely against a solid object or surface adjacent to the bolt to be tightened (Figure 3.1.1-1).

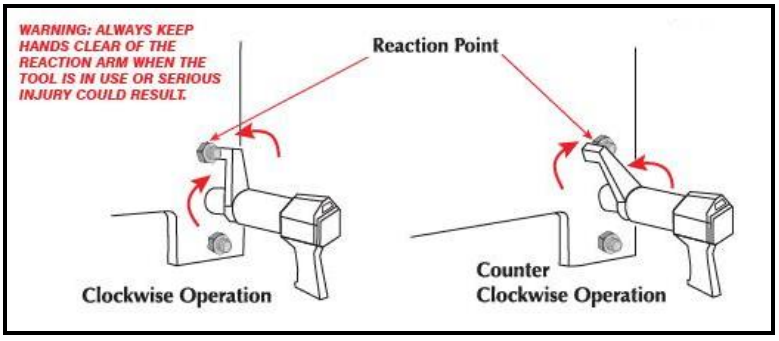
WARNING: ALWAYS KEEP HANDS CLEAR OF THE REACTION ARM WHEN THE TOOL IS IN USE OR SERIOUS INJURY COULD RESULT.
Reaction Point
Clockwise Operation
Counter Clockwise Operation

Figure 3.1.1-1 – Reaction Arm Rotation

CAUTION!

Keep your hand and body parts clear of the Reaction Arm and barrel when the tool is in operation.

Figure 3.1.1-2: Incorrect Placement of Hand/Body Parts During Operation

3.1.2 Reaction Arm Height

Ensure the height of the socket is even with the height of the Reaction Arm as seen below in Figure 3.1.2-1. The height of the socket cannot be shorter or higher than the height of the Reaction Arm as seen below in Figure 3.1.2-2.

CORRECT: The Reaction Arm and socket are even height.

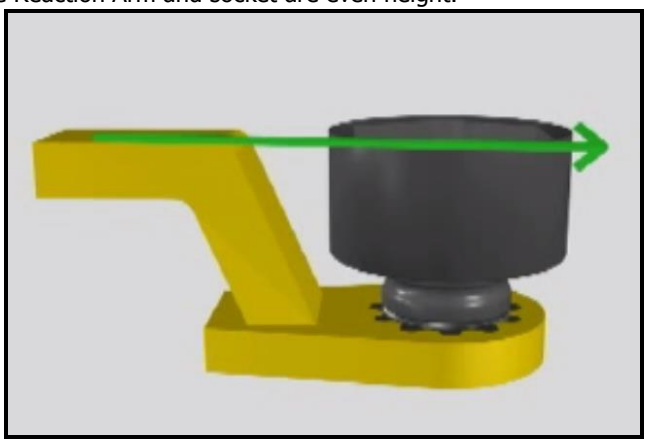

Figure 3.1.2-1: Correct Height

INCORRECT: The leg of the Reaction Arm is too short on the left side, and too long on the right side.

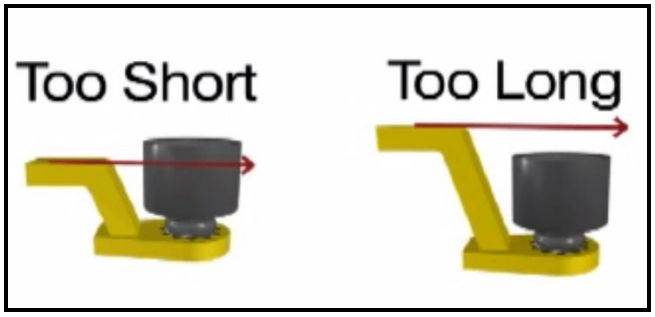

Figure 3.1.2-2: Incorrect Height

IMPROPER REACTION WILL VOID WARRANTY AND CAN CAUSE PREMATURE TOOL FAILURE.

3.1.3 Reaction Arm Foot

Ensure the foot of the Reaction Arm aligns with the length of the nut as seen in Figure 3.1.3-1. The length of the foot cannot be shorter or longer than the nut as seen in Figure 3.1.3-2.

CORRECT: The foot of the Reaction Arm aligns with the length of the nut.

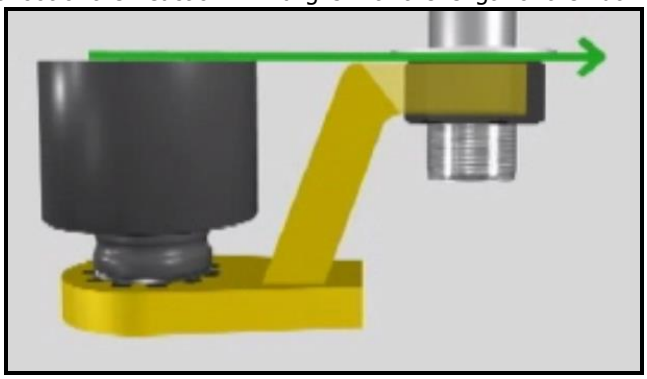

Figure 3.1.3-1: Correct Length

INCORRECT: The foot of the Reaction Arm is too short on the left side, and too long on the right side.

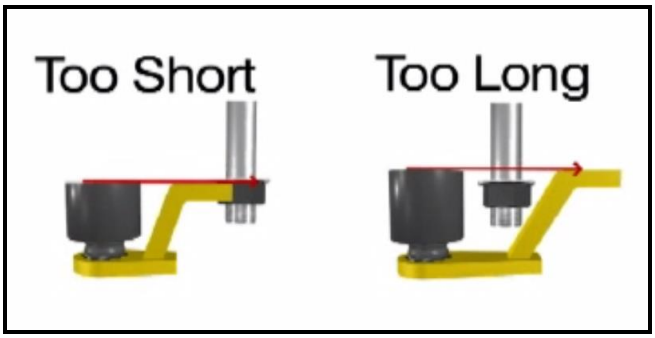

Figure 3.1.3-2: Incorrect Length

Please contact New World Technologies Inc or your local RAD Authorized Distributor for custom Reaction Arms.

3.1.4 Reaction Points

Ensure the Reaction Arm reacts off the middle of the foot as seen in Figure 3.1.4-1. Do not react off the heel of the reaction foot as seen in Figure 3.1.4-2.

CORRECT: Reaction Arm is reacting off the middle of the Reaction Arm's foot.

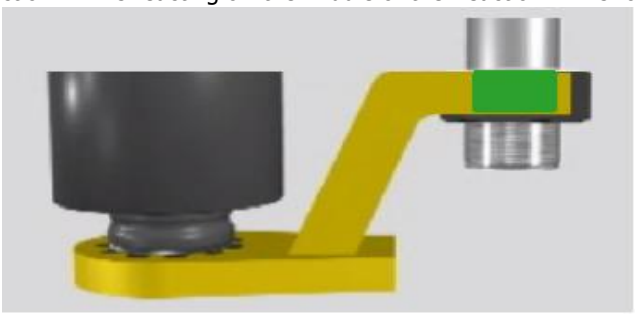

Figure 3.1.4-1: Correct Reaction Point

INCORRECT: Reaction Arm is reacting off the heel of the Reaction Arm. This can cause premature tool failure.

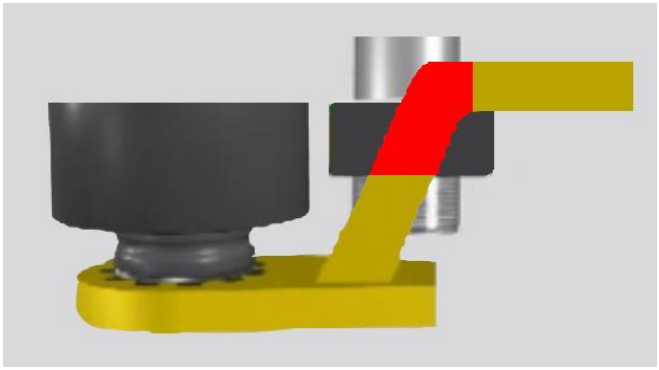

Figure 3.1.4-2: Incorrect Reaction Point

3.2 Torque Operation

To operate the Torque Cycle:

1. Refer to the Torque Chart to determine the desired Torque and Setting.
2. Change the Setting Dial (Figure 3.2-1).

Figure 3.2-1: Setting Dial

3. Place the B-RAD on the joint system.
4. Ensure the Forward/Reverse Switch is in the Forward Position.
5. Press and hold the On/Off Trigger.
   Note: To stop the Torque Cycle at any time, release the On/Off Trigger.
6. When the B-RAD reaches the Torque, the tool will stop turning, release the On/Off Trigger.

4.0 Error

Important!

Disassembling or attempting repair will void warranty.

If breakdown, malfunction, or error occurs, contact New World Technologies Inc. Technical Support (refer to Section 5.0 – Contact Us).

5.0 Contact Us

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